Assessing Impacts to Areas of Special Biological Significance (ASBS)

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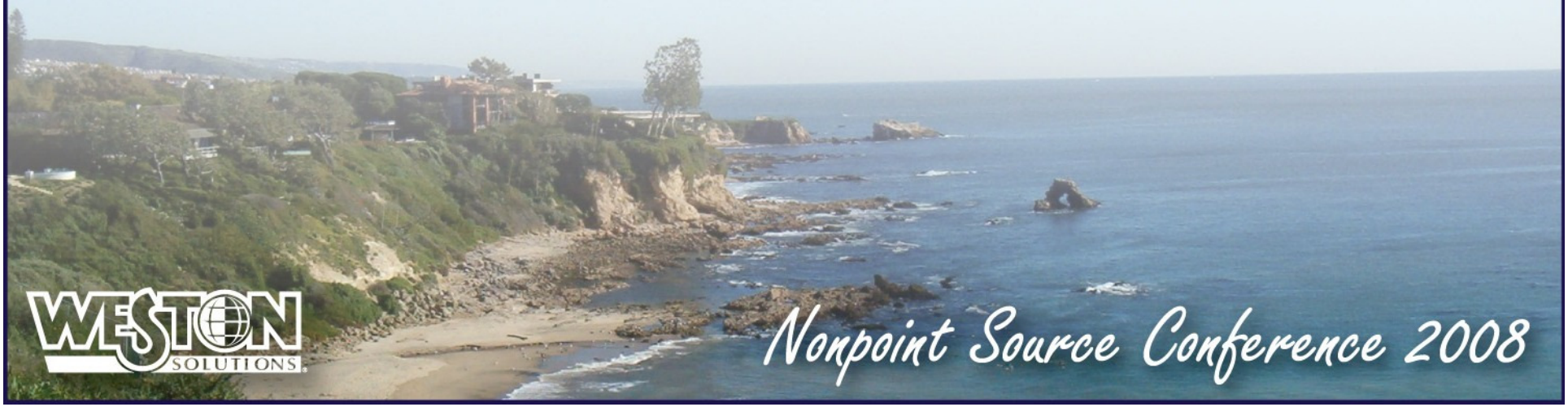
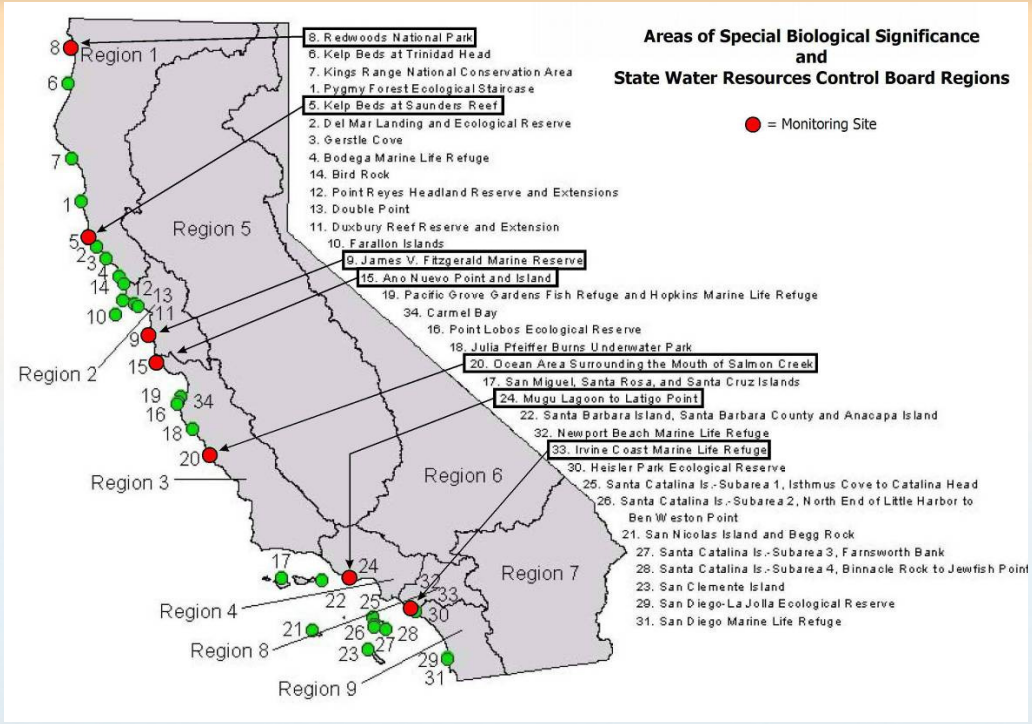


ASBS Overview

- 34 coastal areas designated as ASBS in mid-1970's
- "special biological significance" recognizes that certain biological communities, because of their value or fragility, deserve special protection that consists of preservation and maintenance of natural water quality conditions.



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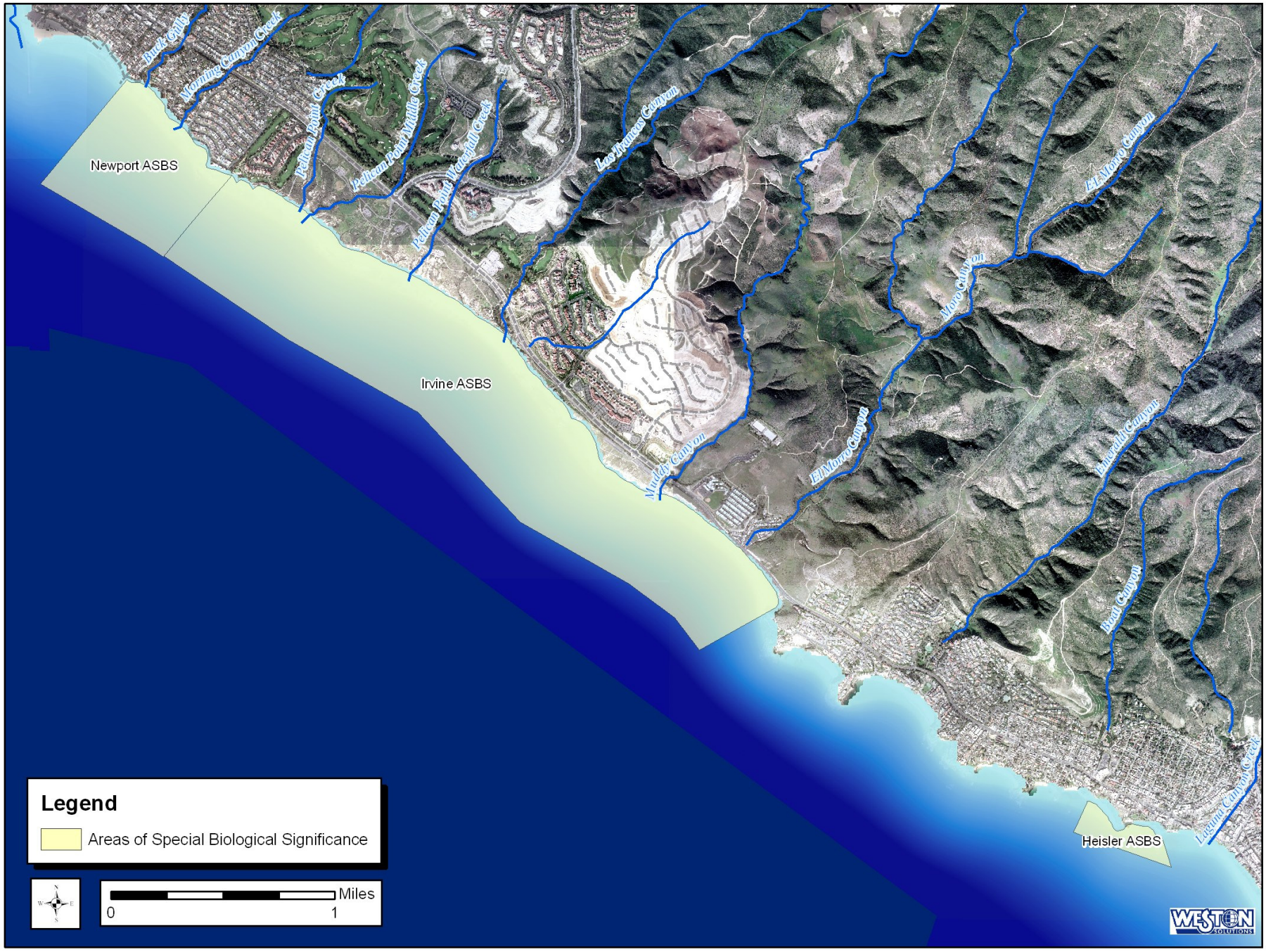
ASBS Regulatory Overview

- Anthropogenic discharges to ASBS (natural gullies, perennial and ephemeral streams)
- California Ocean Plan (COP) prohibits waste discharge into ASBS to ensure maintenance of natural water quality conditions
- State is leading Exception Process to allow wet weather discharges that meet natural water quality conditions
- 1,172 discharges that empty directly into the 14 southern California ASBS have been identified[1]; 70% of which were anthropogenic discharges

[1] Southern California Coastal Research Project (SCCWRP) 2003


Burk Gulch
Morning Canyon Creek
Pelican Point Creek
Pelican Point Wetland/Salt Creek
Pelican Point Wetland Creek
Los Trancos Canyon
Moro Canyon
E/I Moro Canyon
Muddy Canyon
E/I Moro Canyon
Bluebird Canyon
Bluebird Canyon
Laguna Canyon Creek
Newport ASBS
Irvine ASBS
Heisler ASBS
Legend
Areas of Special Biological Significance
Miles
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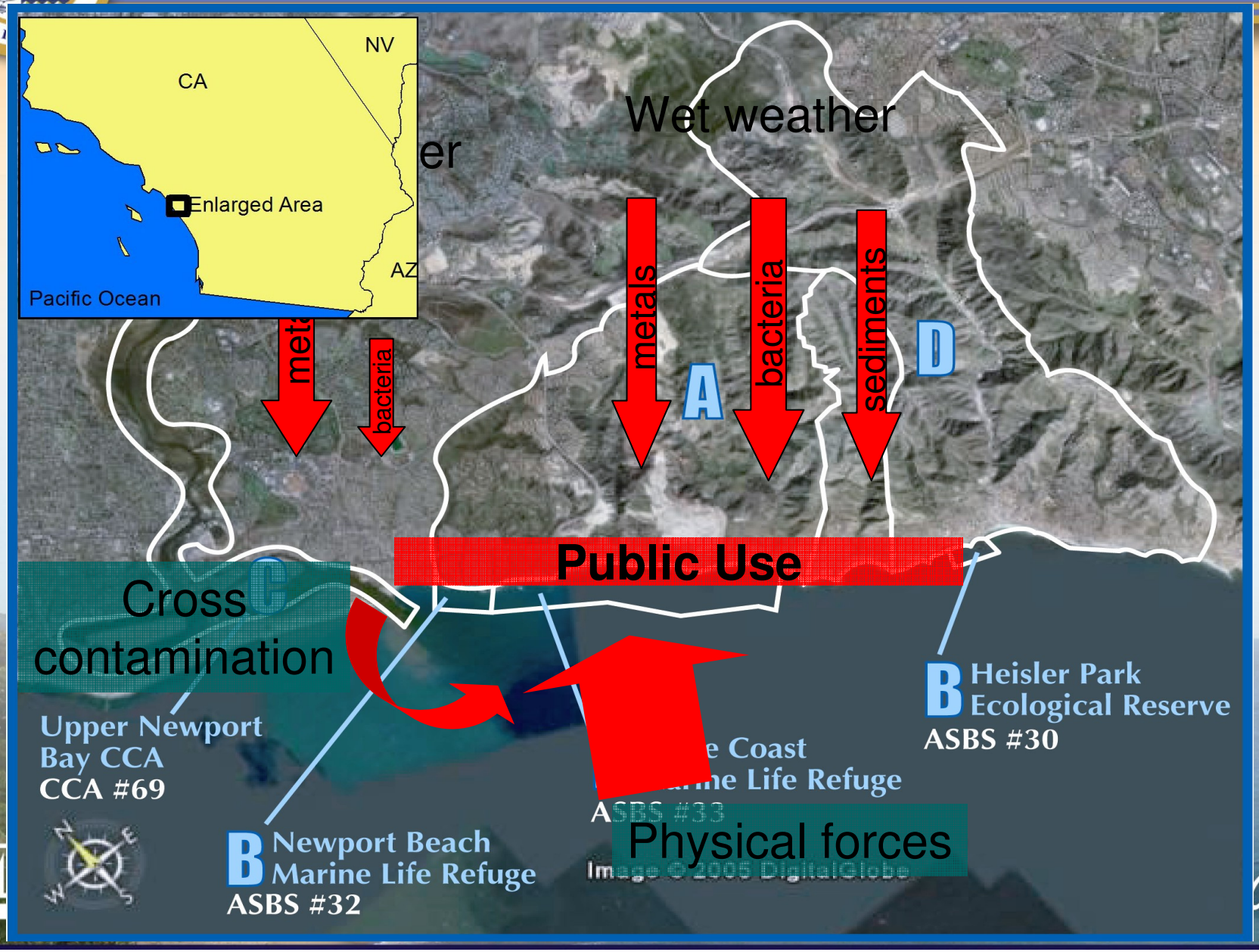
The Newport Coast…
A case study of ASBS impact sources



Anthropogenic Discharge Types

High Potential Load

- Municipal storm water
- Transportation
- Construction and industrial storm water

Medium Potential Load

- Small storm drains
- Nonpoint sources from individual properties

Low Potential Load

- Sea wall weep holes
- Drainage from individual homes or neighborhoods
- Access stairways from individual homes

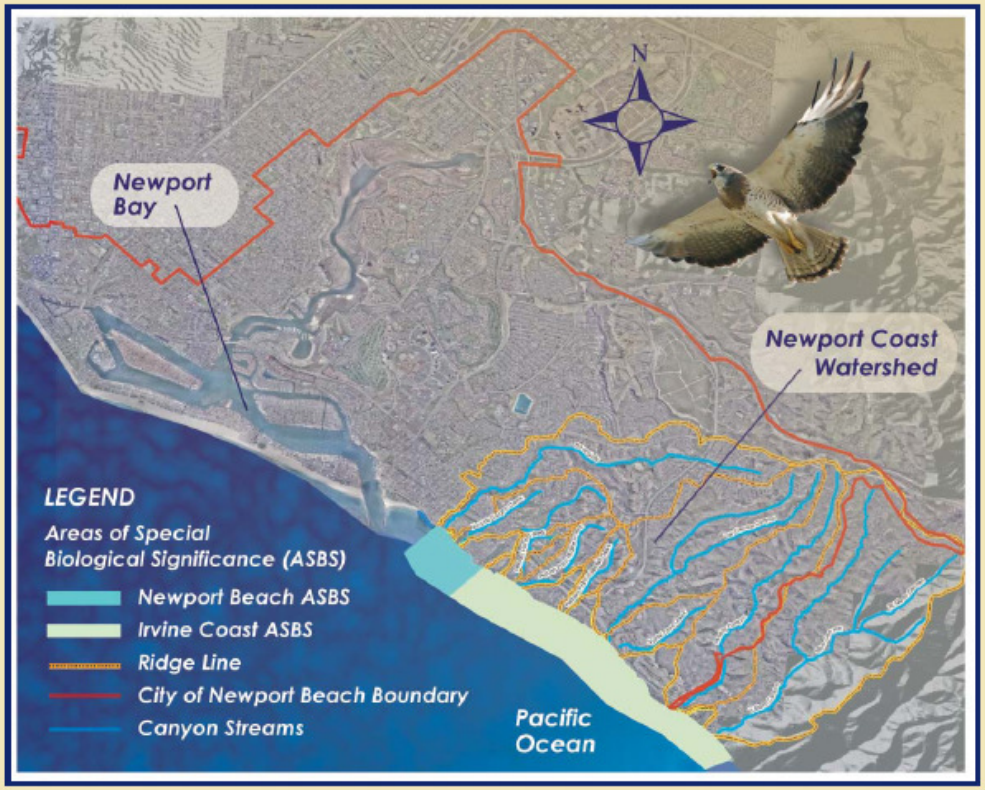
Other Sources of Impacts to ASBS Habitats and Marine Life

Photo: Indiana Geological Survey

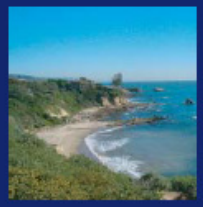
City of Newport Beach

Newport Coast Watershed Management Plan

PLAN HIGHLIGHTS







City of Newport Beach
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Newport Beach, CA 92663
October 2007

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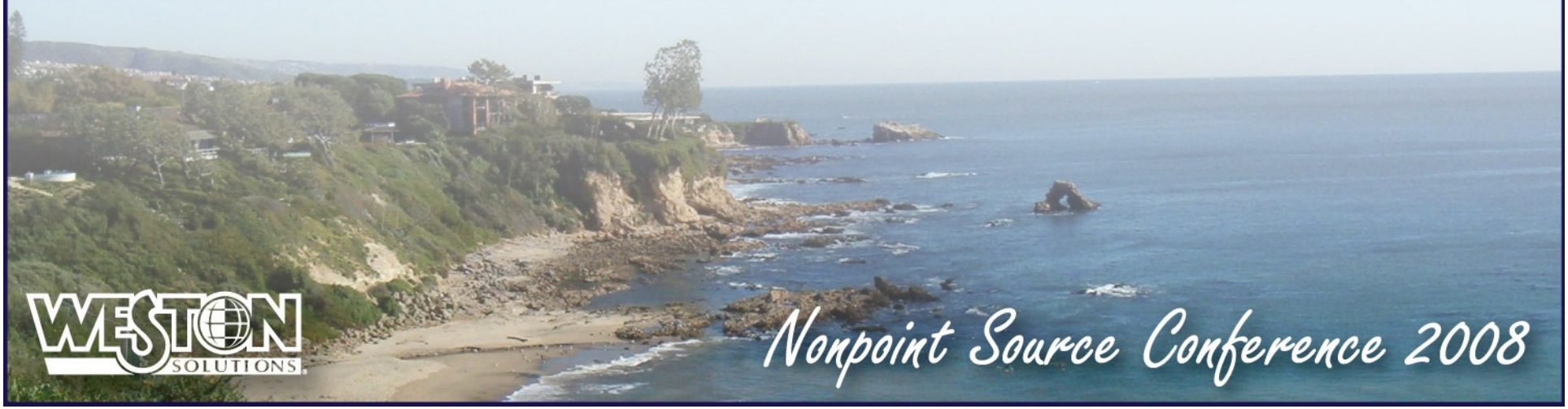
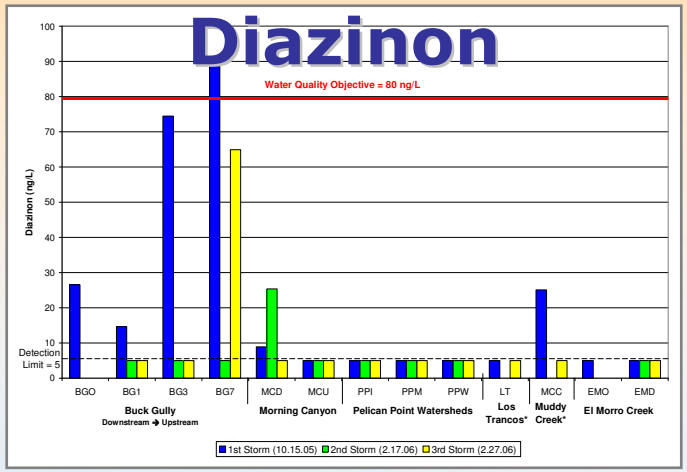
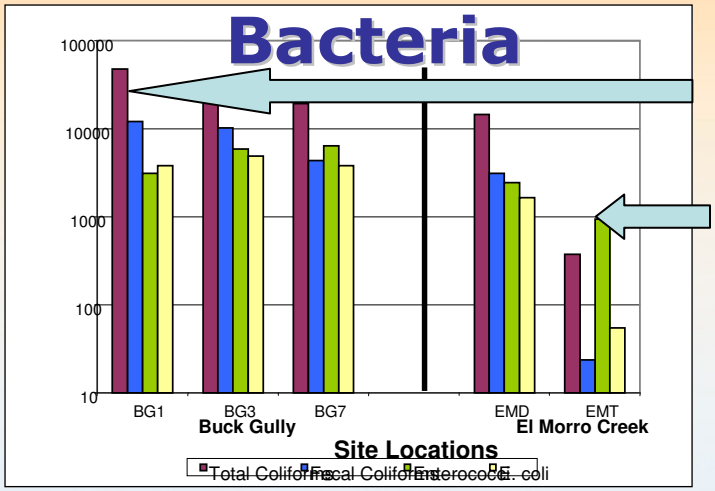
City of Newport Beach ASBS Protection and Restoration Program

- Assessment of Water Quality and Pollutant Loading of Coastal Canyons to ASBS – Dry and Wet Weather
- Development of Water Quality Model to assess Cross Contamination Impact
- Public Impact Study – Year long assessment
- Biological Studies – Bioaccumulation, Toxicity and Community Surveys
- Restoration Pilot Projects
- Development of Impact Metric using results of studies

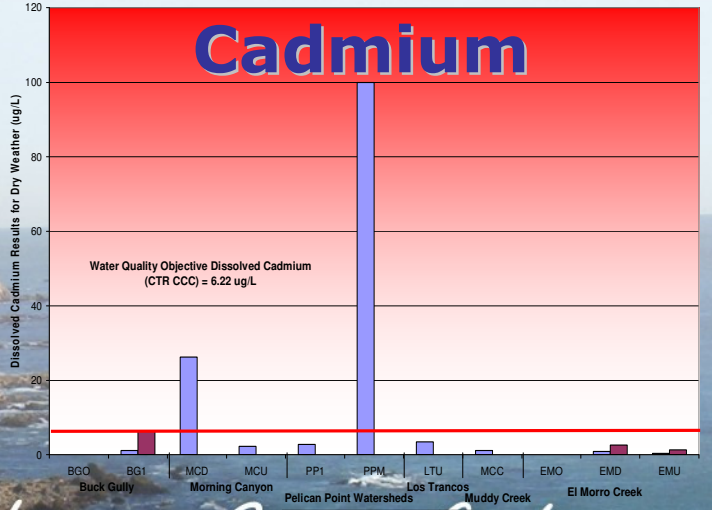


Assessment of Water Quality and Pollutant Loading of Coastal Canyons to ASBS





- Diazinon elevated during storms
- Bacterial levels elevated during storms
- Cadmium elevated in dry weather flows



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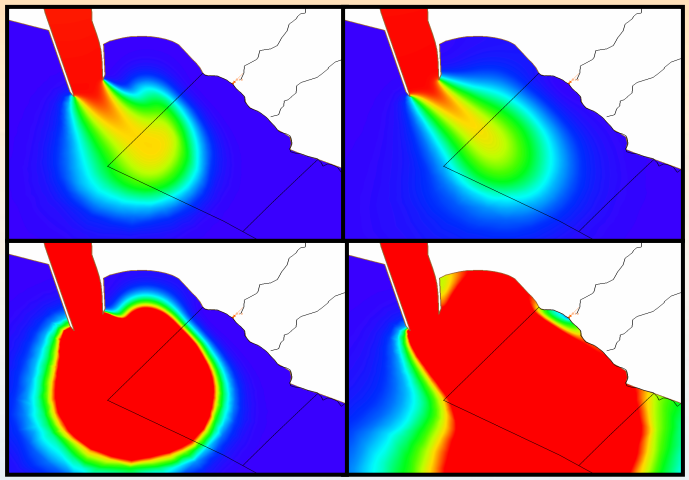
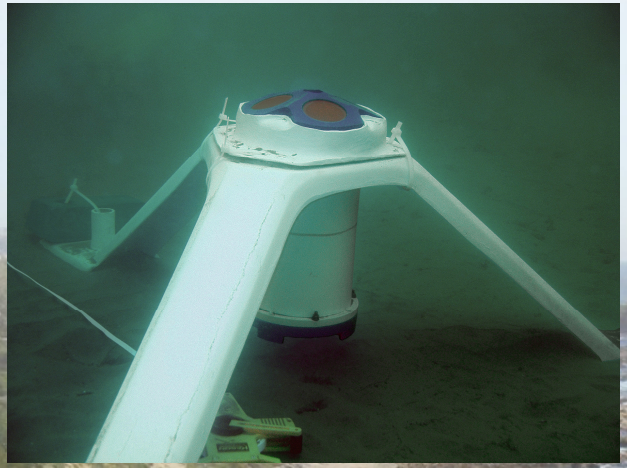
Development of Water Quality Model to assess Cross Contamination Impact





- Current Dynamics offshore of Newport Beach
- Harbor plumes extend throughout ASBS
- Verification of modeling assumptions for Newport Harbor discharges currently being evaluated

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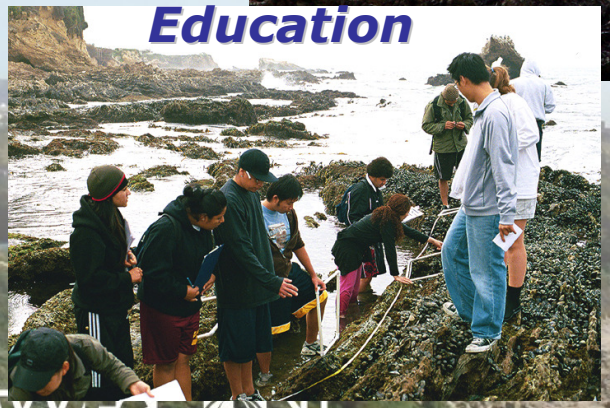
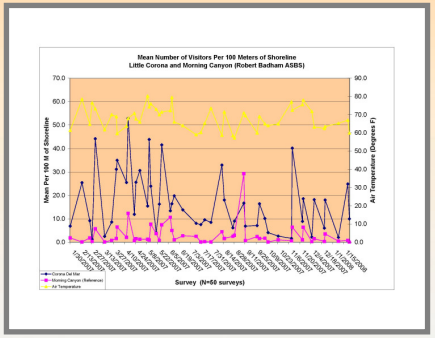
Public Impact Study

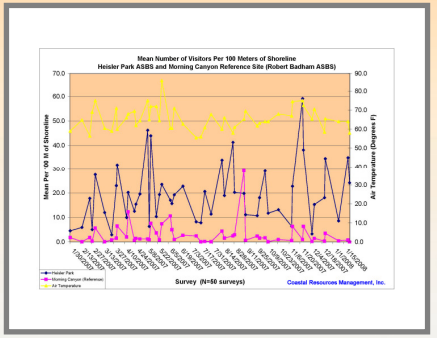
Trampling

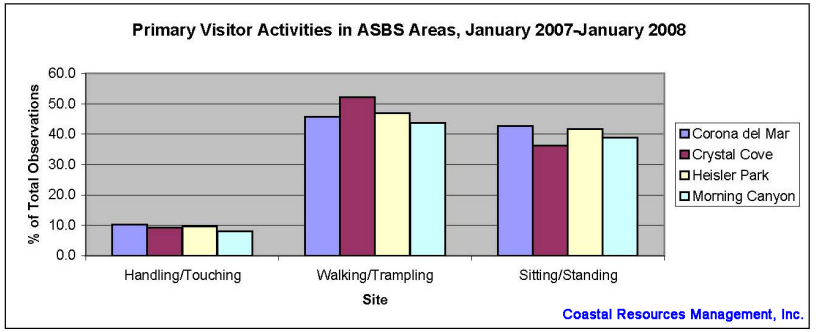
Fishing & Bait Collection

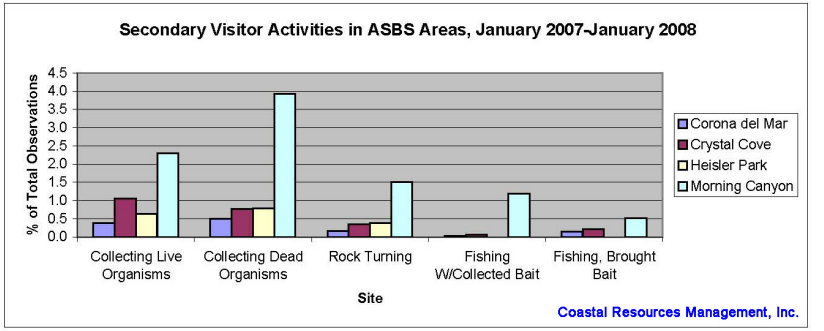
Education











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Biological Studies

- Toxicity
  - Kelp survival and growth in storm water effluent
- Bioaccumulation
  - Mussel outplant study
  - Mussel survival and growth test
- Intertidal Community Surveys
  - Baseline for long-term monitoring program
  - Target species for specific impacts

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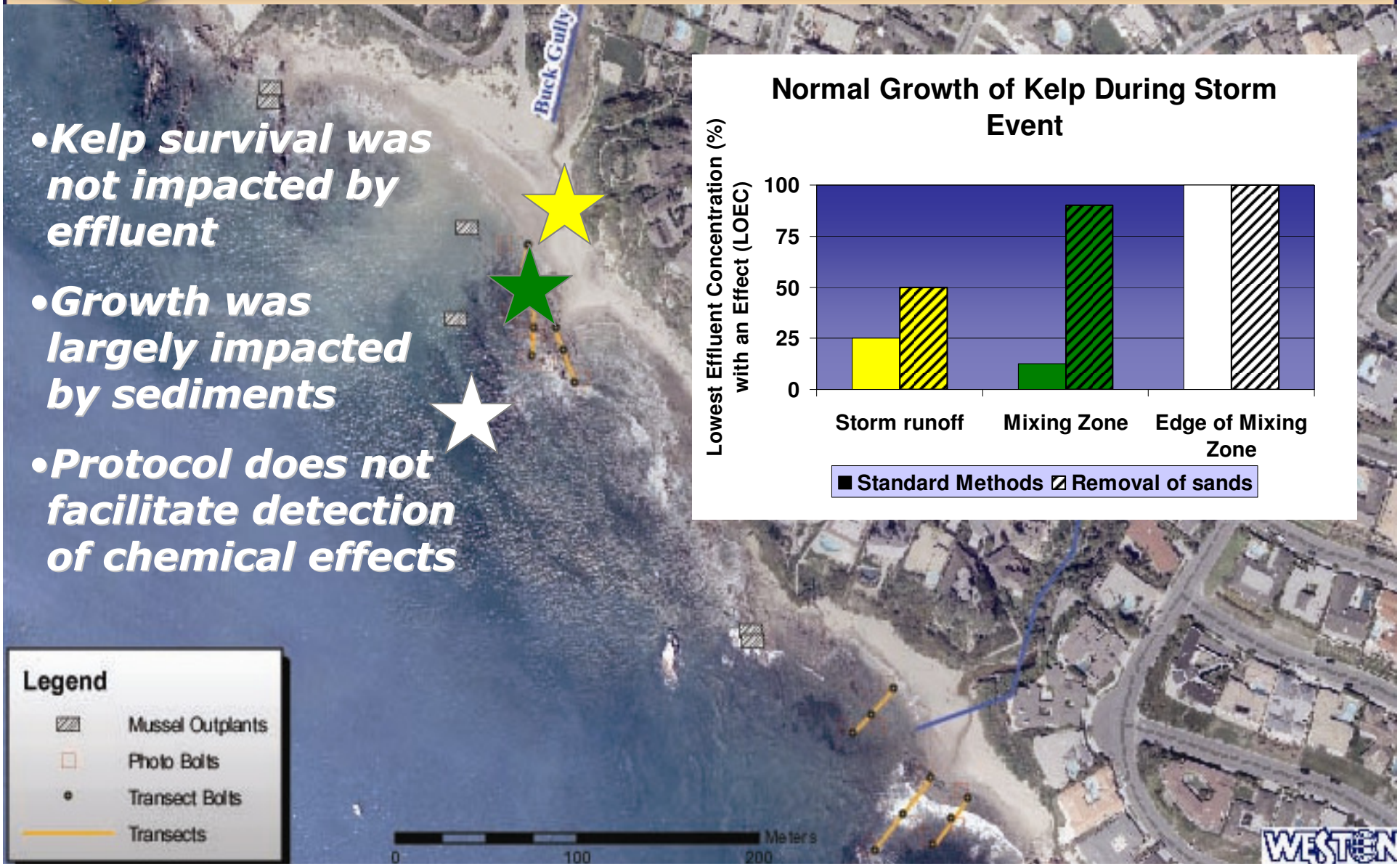
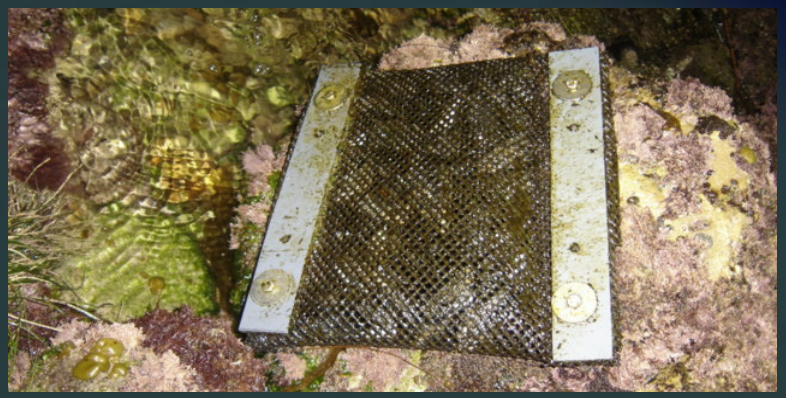
Stormwater Effluent: Kelp Toxicity

- *Kelp survival was not impacted by effluent*
- *Growth was largely impacted by sediments*
- *Protocol does not facilitate detection of chemical effects*

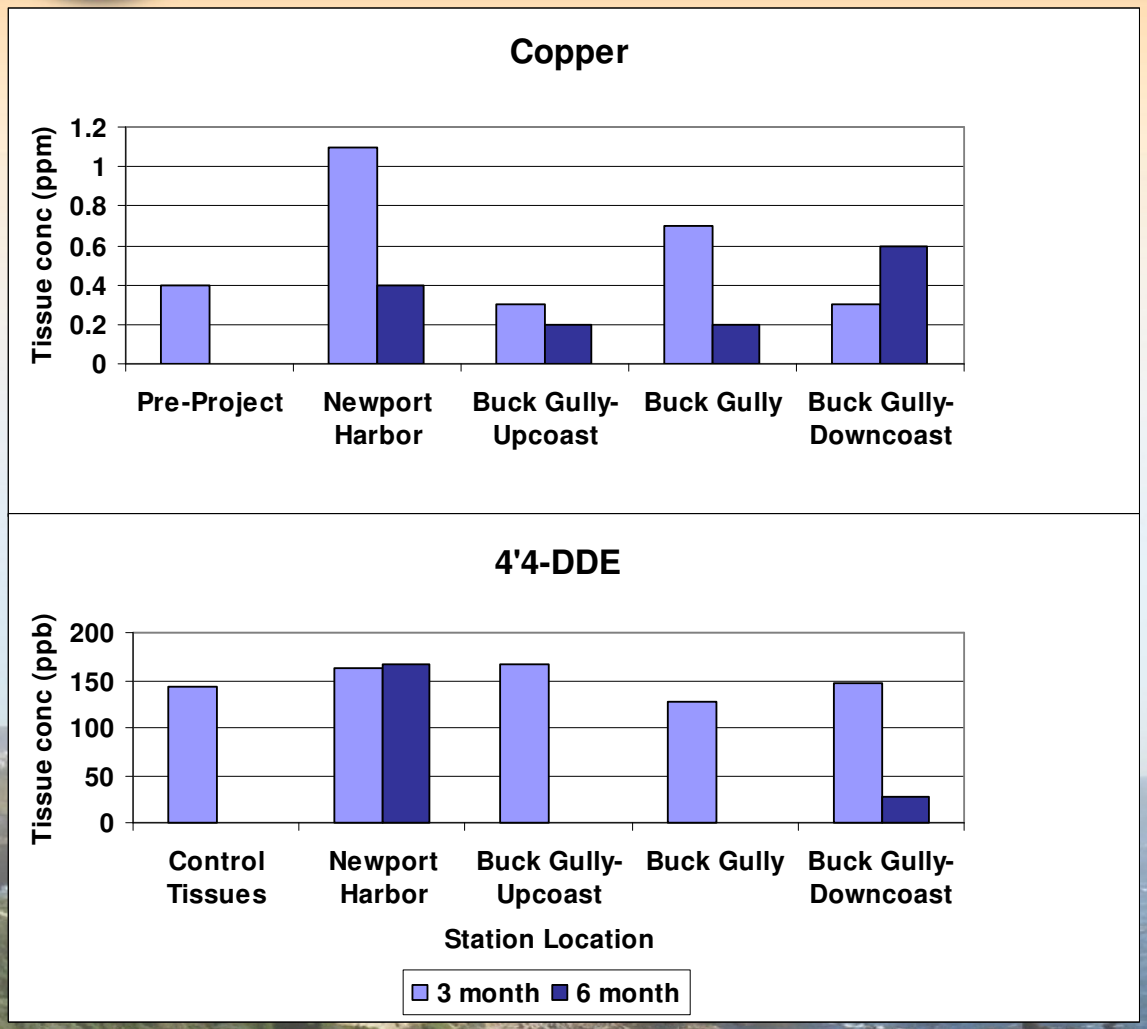


Mussel Bioaccumulation Study



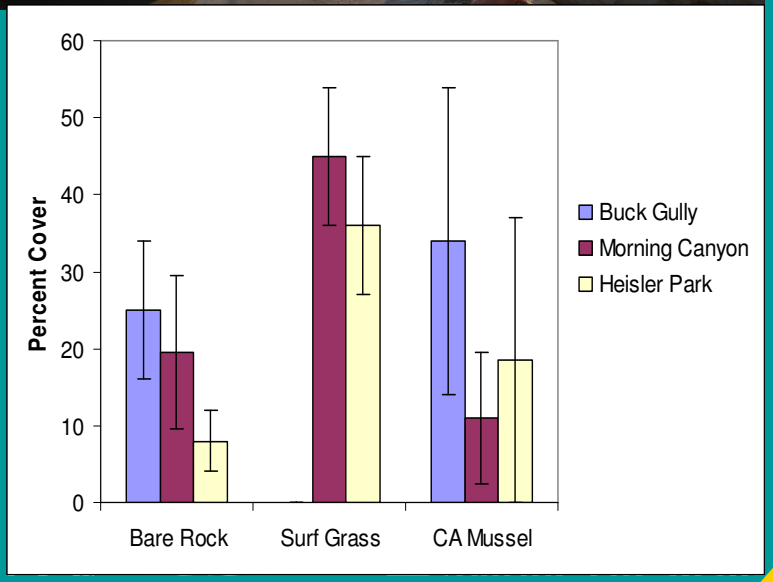
- Study to identify bioaccumulation of contaminants of concern in mussel tissue
- Mussels transplanted into 4 locations
- Exposed for 3 and 6 months

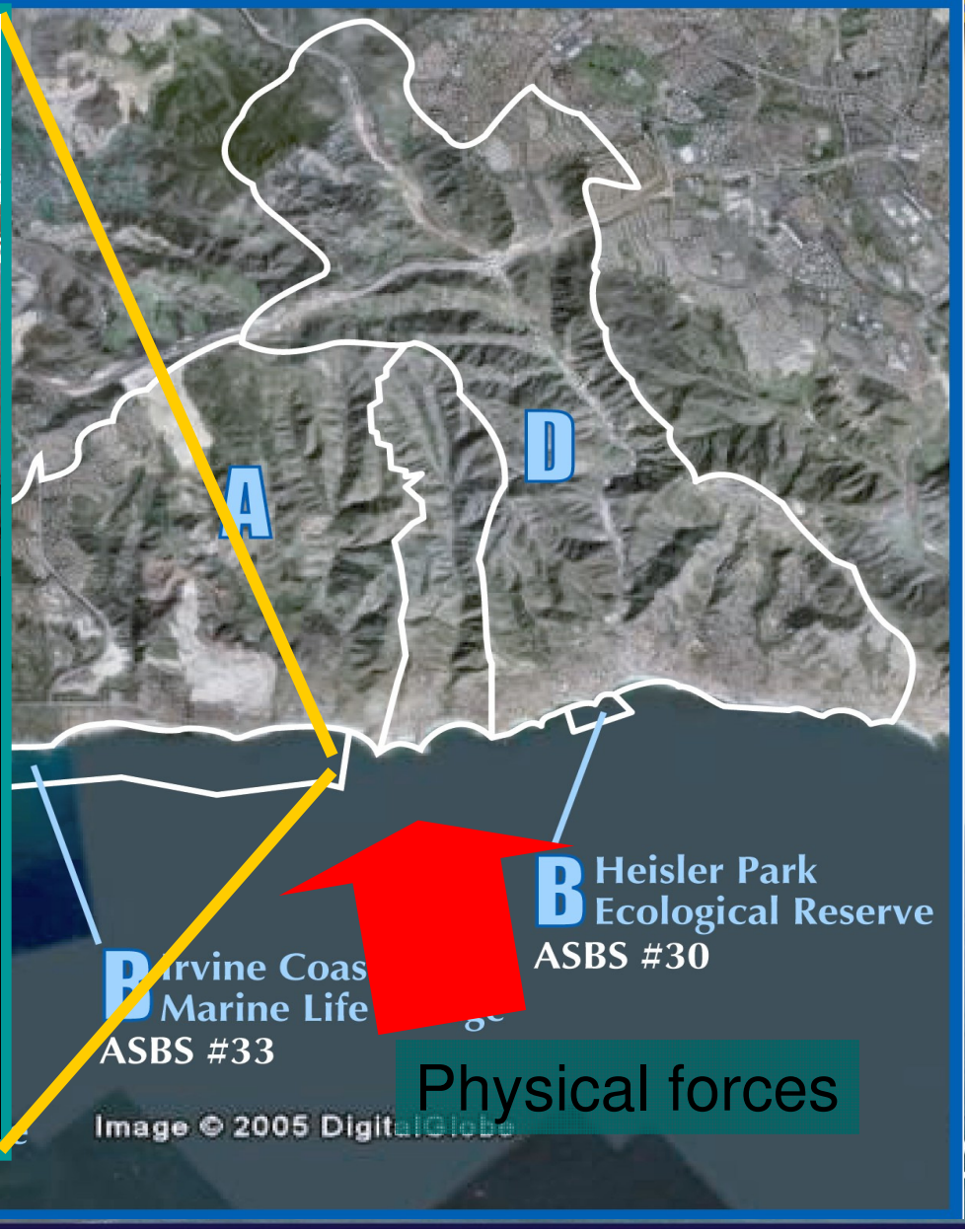
Bioaccumulation Results



- PAHs, 4'4-DDE, metals detected
- No detectable PCBs, pyrethroids, mercury, or OP pesticides
- No evident patterns related to time or distance relative to Buck Gully or Newport Harbor
- Mussel development toxicity tests indicate similar sensitivity to copper exposure in lab experiments

Intertidal Surveys





Physical forces

Restoration Pilot Projects

- Current trend for ASBS:

  Large to mid-sized, fleshy algae are decreasing while smaller turf-forming macrophytes are increasing








Pilot Restoration: *Silvetia compressa*

- Two restoration techniques attempted:
  - Seeding
  - Juvenile transplantation
- Treatments:
  - Herbivore exclusion
  - Simulated canopies
- Large storms in 2007 wiped out restoration experiments

Restoration Site

Comparative Assessment of Impacts in ASBS
The Impact Metric

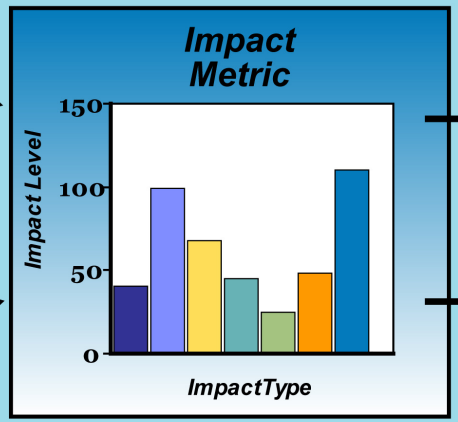
Potential Impacts

Public Use

Watershed/ Dry-Weather Flow

Cross-Contamination

Environmental/ Physical



Prioritized Actions to Address High Level Impacts

Protect and Restore ASBS

2008

Impact Metric

INDICATORS	Water Quality		Cross Contamination	Public Use	Environmental/ Physical
	Wet	Dry			
Water Chemistry	X	X	X		
Bioaccumulation	X	X	X		
Toxicity		X			
Ulva (green alga)		X			
Open Substrate	X	X		X	X
Surf Grass	X	X		X	X
Fleshy Algae				X	X
Sea Stars				X	X
Mussel Beds				X	X
Limpets				X	X
Species Diversity	X	X	X	X	X

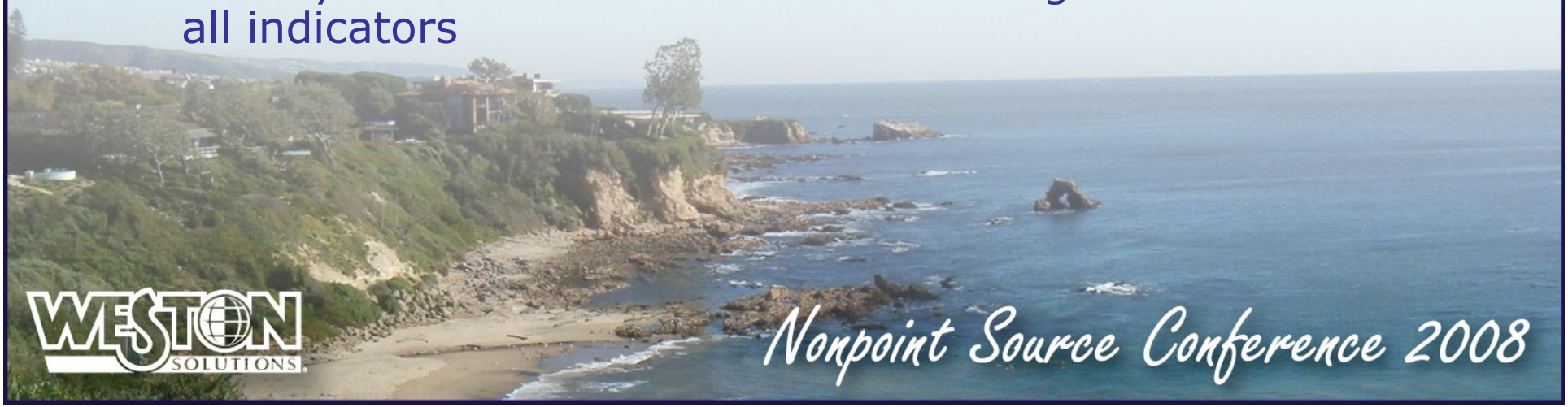
Impact Metric

Organism	Impact Type	Test	Grade Criteria	Grade
 *Macrocystis*	Wet weather (stormwater) effect on kelp reproduction	EPA methods Sites influenced by Buck Gully compared to control sites	Impact site not significantly different from Control site	
			75% normal < Impact site < 90% control	
			60% normal < Impact site < 75% control	
			45% normal < Impact site < 60% control	
			Impact site < 45% control	
 *Mytilus*	Wet weather (stormwater) effect on development	EPA methods Comparison of percent development from mussels deployed near Buck Gully to control sites	Impact site not significantly different from Control sites or >90% normal	
			60% normal < Impact site < 80% normal	
			40% normal < Impact site < 60% normal	
			20% normal < Impact site < 40% normal	
			Impact site < 20% normal	
 *Mytilus*	Wet weather (stormwater) effect on development	EPA methods Laboratory reference toxicant test compared to controls and established standards	Impact site not significantly different from control site or reference chart	
			Impact site sig. different from control site but w/in 2 std. dev. of lab control chart	
			Impact site sig. different from control site & outside 2 std. dev. of lab control chart	

- Parameter assessed against field and/or literature-based criteria
- Grade weighted by indicator-specific ecologically relevant criteria
- Overall impacts assessed by a weight-of-evidence approach

Impact Metric Summary

- Metric incorporates various types of impacts and assigns indicator(s) to estimate impacts
- Indicator performance studied using ecologically relevant and sound scientific data collection methods
- Assessments based on experimental controls and/or established scientific literature
- Priority recommendations based on weight-of-evidence for all indicators

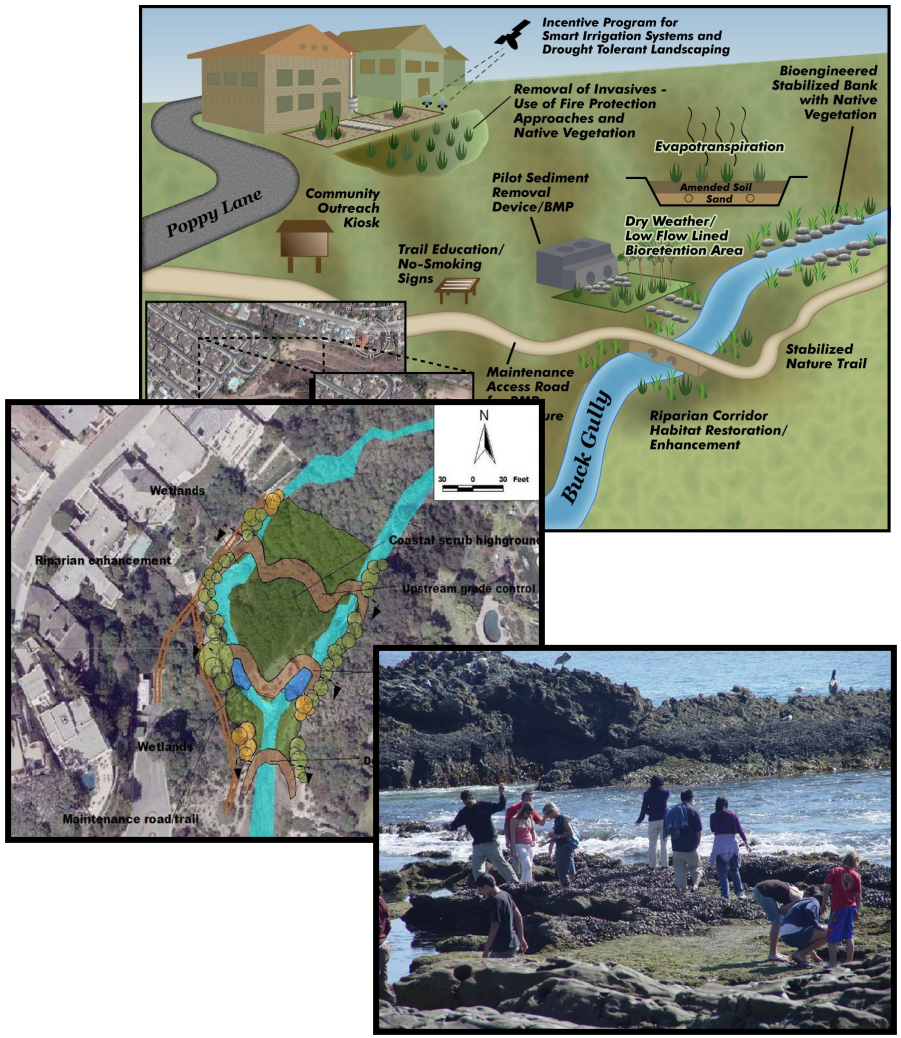


Implementation of the ICWMP Prioritized to Address Impacts

What are we doing right now?

- Erosion Controls and Habitat Enhancement in Buck Gully
- Runoff Reduction Program
- Public Outreach – Expanded Docent Program
- Pilot Rocky Inter-tidal Restoration Project – Cal State Fullerton

Implementation of the ICWMP Prioritized to Address Impacts



What do we plan to do in the near future?

- Acquiring Resources for Completing Metric and Fill in Data Gaps – Coordination with Bight08
- Public Impact Reduction Program
- Natural Treatment System and Habitat Restoration in Lower Buck Gully
- Low Impact Development Project
- Expand Runoff Reduction Program

Questions?

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